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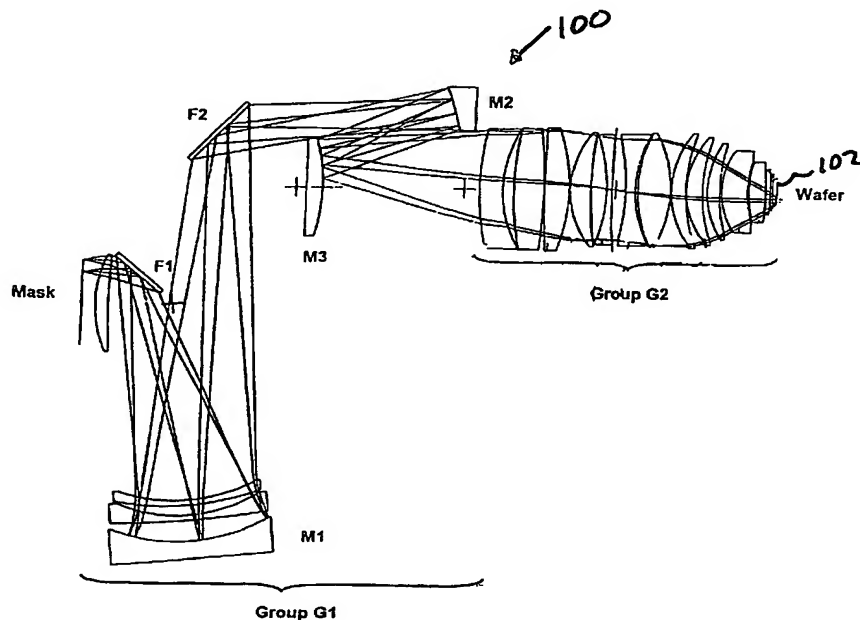
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- Published:
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CATADIOPTRIC MULTI-MIRROR SYSTEMS FOR PROTECTION LITHOGRAPHY



(57) Abstract: According to one exemplary embodiment, a photolithographic reduction projection catadioptric objective is provided and includes a first optical group (G1) and a second substantially refractive optical group (G2) more image forward than the first optical group (G1). The second optical group (G2) includes a number of lens elements (E4-E 16) and has a negative overall magnifying power for providing image reduction. The first optical group (G1) has a folded geometry for producing a virtual image and the second optical group (G2) receives and reduces the virtual image to form an image with a numerical aperture of at least substantially (0.80).

INTERNATIONAL SEARCH REPORT

Intern: .pplication No
PCT/US 02/22766

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02B17/08 G03F7/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G02B G03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01 51979 A (ZEISS CARL) 19 July 2001 (2001-07-19) the whole document	1-41
X	WO 02 44786 A (CARL ZEISS SEMICONDUCTOR MFG T ;HUDYMA RUSSELL (US)) 6 June 2002 (2002-06-06) the whole document	1-41
X	US 6 362 926 B1 (ICHIHARA YUTAKA ET AL) 26 March 2002 (2002-03-26) abstract; figure 1	1-41

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

14 January 2003

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24/01/2003

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INTERNATIONAL SEARCH REPORT

Int. application No.
PCT/US 02/22766

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 02 22766

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

In view of the large number and also the wording of the independent claims presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.3 PCT) to such an extent that a detailed meaningful search is impossible.

In particular, the plural independent claims attempt to define the invention in a very vague and unspecific manner and fail to clearly define the structural features of the claimed projection objective.

For the purpose of establishing the International Search Report, the search has been carried out on the basis of the claims interpreted in the light of the description, namely page 4, line 21-page 6, line 3 and figures 1-5 and the corresponding description.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internal Application No
PCT/us 02/22766

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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